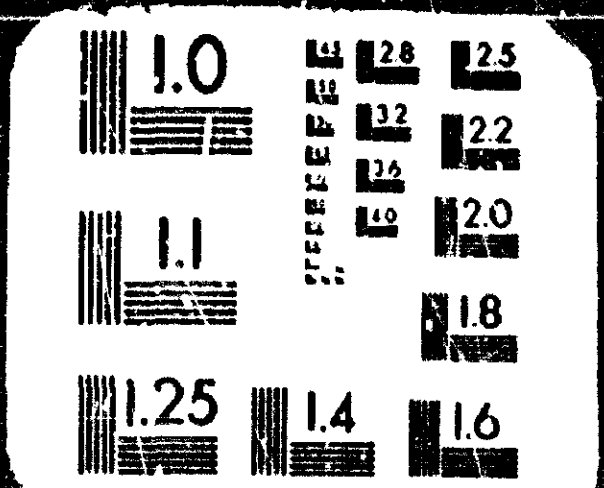
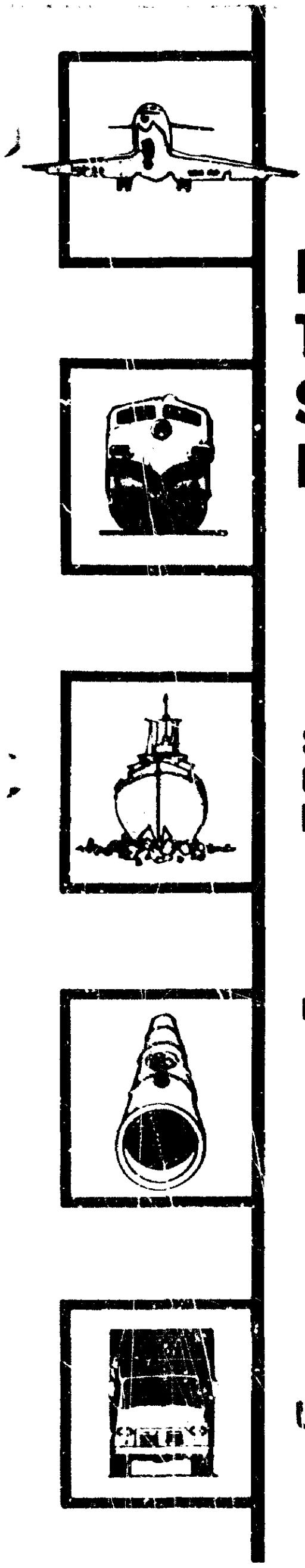


PB81-103384

Safety Effectiveness Evaluation of the Materials Transportation Bureau's Pipeline Data System

(U.S.) National Transportation Safety Board
Washington, DC

12 Aug 80



NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C. 20594

SAFETY EFFECTIVENESS EVALUATION OF THE MATERIALS TRANSPORTATION BUREAU'S PIPELINE DATA SYSTEM

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16. Abstract

This study evaluates the management and use by the U.S. Department of Transportation of its gas pipeline data system, and examines the types of data collected, how the system operates, and how the DOT uses it to promote public safety regarding gas pipelines. The study also evaluates the changes to the system that are currently being considered by the DOT and whether further changes are required.

The evaluation found that Materials Transportation Bureau staff resources are limited, and that, consequently, use of the data to direct and focus resources is essential for the effective and efficient administration of the Pipeline Safety Act. The Safety Board concluded, however, that the data currently collected are often inaccurate and are not representative of gas pipeline operators and gas pipeline accidents. Furthermore, the system is seldom usedby MTB offices in carrying out their regulatory and enforcement functions, and there is little coordination regarding the system between the Safety Data Management Branch and the regulation and enforcement offices. The study found that the MTB does not have a pipeline data analysis plan, which the Safety Board believes is necessary to coordinate and direct the MTB offices in the use of the data system as a management tool.

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NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

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SAFETY EFFECTIVENESS EVALUATION OF THE MATERIALS TRANSPORTATION BUREAU'S PIPELINE DATA SYSTEM

I. INTRODUCTION

The Natural Gas Pipeline Safety Act of 1968 1/ (as amended) makes the Secretary of Transportation responsible for promulgating and enforcing gas pipeline safety regulations to reduce the potential for fatalities, injuries, and property damage associated with pipeline failures. To meet these responsibilities, the Secretary is authorized by the Act to collect data on natural gas pipeline systems. The Act states that:

> Each person who engages in the transportation of gas or who owns or operates pipeline facilities shall establish and maintain such records, make such reports, and provide such information as the Secretary may reasonably require to enable him to determine whether such person has acted or is acting in compliance with this Act and the standards established under this Act.

Regulations specifying reporting requirements for pipeline operators were published in 1970 and are contained in 49 CFR 191. The stated purpose of these requirements is to provide:

> factual data that will give the Department a sound statistical base with which to define safety problems, determine their underlying causes, and propose regulatory solutions. 2/

The purpose of this report is to evaluate the management and use by the Department of Transportation (DOT) of its gas pipeline data system. An extensive pipeline system in the United States and limited DOT resources have meant that both regulatory development and enforcement activity in pipeline safety have been selective. Because DOT pipeline resources are unlikely to significantly increase in the future, the National Transportation Safety Board (NTSB) believes that use of a data system to identify problems and direct limited resources is of particular importance to those DOT offices responsible for promoting the public safety regarding gas pipelines. In the past, these offices have been criticized both for inadequacies in the data which are collected and for the absence of a plan for data use. In this evaluation, the NTSB examines the types of data collected, how the data system operates, and how it is being used. Also, this study evaluates the DOT's efforts to improve the data system and whether further changes are required.

1/ Natural Gas Pipeline Safety Act of 1968, P.L. 90-481, August 12, 1968; 49 USC 1671 et seq.
2/ 35 FR 317, January 8, 1970.

This study deals with the natural gas pipeline data system. However, the findings of this report are also applicable to the data collection system and data uses for liquid pipelines. For the purposes of this study, the gas pipeline data system will be considered to include two general types of information. Certain data are required to be submitted by pipeline operators in accordance with Federal regulations. These include telephonic notification of leaks, written reports of leaks, and written annual reports. These data are computerized and comprise the basis of the pipeline data system. Other information, such as the results of enforcement actions, are contained in pipeline office records and files, and also are considered part of the pipeline data system. All of these data types are discussed in detail in chapter III.

This report was developed by the NTSB through review of past NTSB reports; through review of the relevant legislation, legislative history, and pipeline safety regulations, including a review of selected Notices of Proposed Rulemaking (NPRM's) and docket comments; through a general literature search, including past reports on pipeline data systems and relevant congressional testimony; through review of DOT documentation concerning enforcement and regulatory activity associated with pipeline data; and by conducting extensive interviews. Interviews were conducted with DOT officials associated with pipeline regulation and enforcement, including office heads and division chiefs, as well as other staff (including regional office staff). In addition, representatives from industry were consulted.

II. BACKGROUND

a. Organization and Resources of the Materials Transportation Bureau

Over a million miles of pipeline transport natural gas to more than 46 million customers in the United States. This pipeline network is run by nearly 30,000 operators subject to Federal regulations, and consists of 840,000 miles of distribution system mains, 180,000 miles of transmission system lines, and 20,000 miles of gathering system lines. 3/ In 1978, 840,000 gas leaks were reported to have been repaired by operators of gas pipeline systems; 2,000 of these were serious enough to require, by regulation, an individual leak report. The serious failures in the system during 1978 resulted in 37 fatalities and 452 injuries. 4/

Gas pipeline safety was made the responsibility of the Secretary of Transportation by the Natural Gas Pipeline Safety Act of 1968, which has been

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3/ A gathering line is a pipeline or network of pipelines that transports natural gas from an individual well or current production facility to a compressor station, processing point, transmission line, or main trunk pipeline. A transmission line transmits gas from a source of supply to one or more distribution centers, to one or more large volume customers, or interconnects sources of supply. A distribution line carries or controls the supply of gas to final delivery at a sales meter.

4/ For gas pipeline statistics see Materials Transportation Bureau, "Tenth Annual Report on the Administration of the Natural Gas Pipeline Safety Act," (DOT-RSPA-MTB-79/1) and draft copy of "Natural Gas Pipeline Statistics," April 1980, Annual Report for 1978 (DOT-TSC-RSPA-80-2).

most recently amended by the Pipeline Safety Act of 1979. 5/ The Secretary has delegated his authority for pipeline safety to the Director of the Materials Transportation Bureau (MTB), a functional unit within the DOT's Research and Special Programs Administration (RSPA). Prior to a reorganization within the MTB in June 1978, pipeline safety functions were handled by a single MTB division first called the Office of Pipeline Safety (OPS) and later renamed the Office of Pipeline Safety Operations (OPSO). Subsequent to June 1978, the functions of OPSO were divided among several offices. The current organization of the MTB is shown in figure 1.

Development and issuance of regulations is carried out by the Office of Pipeline Safety Regulation, which is staffed by 18 persons (clerical support included). Enforcement activities are handled by the Pipeline Safety Enforcement Division within the Office of Operations and Enforcement (OOE). Much of the pipeline enforcement function is carried out through five regional offices, headquartered in Washington, D.C., Atlanta, Kansas City, Houston, and Burlingame, California. The enforcement division is staffed with 27 persons, 21 of whom comprise the staffs of the regional offices. 6/ The regional chiefs report directly to the head of the OOE, and are allowed relative autonomy in planning and carrying out enforcement duties in their regions.

A third MTB unit whose operations are of concern to this report is the Safety Data Management Branch, a part of the Program Development Division within the Office of Program Support. It is this office which deals most directly with the pipeline data which are required by regulation to be submitted by individual operators. At present, there is no head, or acting head, of the Office of Program Support, nor is there a chief or acting chief of the Program Development Division. Both these positions are vacant, and have been so since April 1979 and August 1979, respectively. Responsibility for the pipeline data system currently lies with the chief of the Program Analysis Branch, who is, concurrently, acting chief of the Safety Data Management Branch and program manager for the development of the Hazardous Materials Information System (HMIS). 7/ His staff, available for work on pipeline data, consists of two persons, most of whose time is spent processing incoming report forms and answering requests for data, most external to the MTB. The acting branch chief reports directly to the MTB director, but without the authority of an acting office head. There is no mission statement describing the duties of this unit and defining its role in the agency.

5/ Pipeline Safety Act of 1979, P.L. 96-129, November 30, 1979. Statutory authority for the regulation of all pipeline and storage facilities used for transporting hazardous gases and liquid in commerce is provided by several additional laws: Mineral Leasing Act of 1920, as amended (30 USC 185); Hazardous Materials Transportation Act of 1974 (49 USC 1801 et seq); Transportation of Explosives Act (18 USC 1520 (a)); and the Alaska Natural Gas Transportation Act of 1976 (15 USC 719).

6/ Staffing of each region is as follows: East, 3; South, 5; Central, 5; Southwest, 5; West, 3.

7/ The HMIS is an effort to establish a DOT-wide data base which would centralize, make accessible, and plan analyses of information regarding all hazardous materials transportation modes, including pipeline.

RESEARCH & SPECIAL PROGRAMS ADMIN.

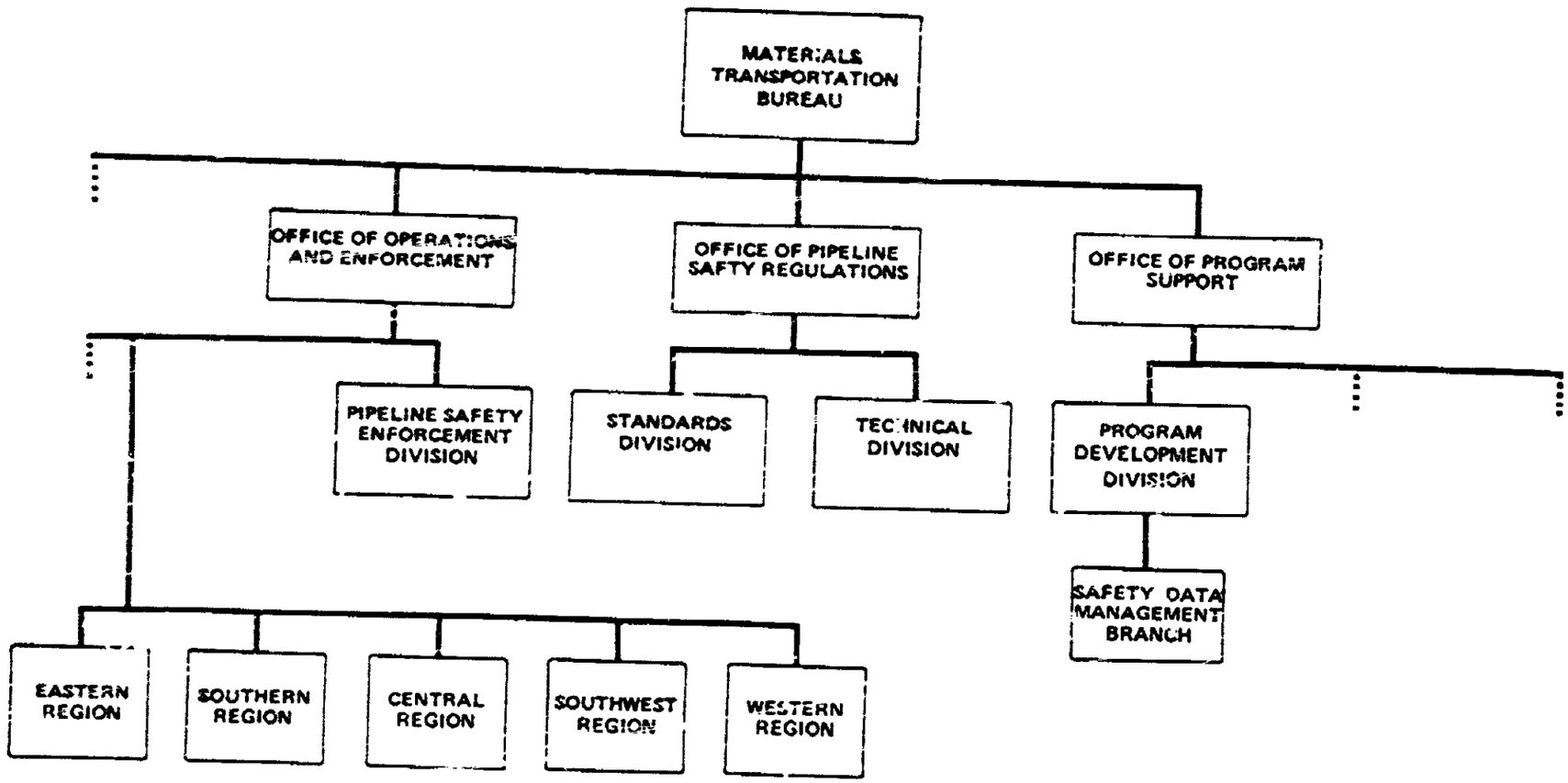

Figure 1.—MTB organizational chart showing only those elements discussed in report.

MTB officials have told the NTSB that a reorganization is being planned to deal with this situation. The Office of Program Support is to be abolished and replaced by an Office of Regulatory Planning and Analysis. The purpose of this unit, to be staffed on a par with the other MTB offices (18-20 persons) would be:

> to provide integrated planning, development and evaluation of regulatory activities of MTB; to assure that all such activities are fully coordinated internally and externally; and to maintain the information system necessary to support these activities. 8/

Functions of the office are to include establishing and maintaining reporting systems which "gather, process, and analyze accident and operation data for pipeline operators. . . ." As of this writing, the planning for this new office has been approved by the RSPA and is being reviewed by the Office of the Secretary of Transportation.

It should also be noted that a RSPA division separate from the MTB, the Transportation Systems Center (TSC; located in Cambridge, Massachusetts), works with the MTB, in particular, the Safety Data Management Branch, to provide computer services and to help in the development of a RSPA-wide data system.

In interviews with the NTSB, MTB pipeline officials repeatedly pointed out the limited resources available to regulate and enforce pipeline safety. For example, in the enforcement office's western region, 2 inspectors are responsible for a pipeline network of nearly 200,000 miles (about 1/5 of the total system), including an estimated 15,000 master meter operators (about 1/2 of the total in the system). 9/ Nonetheless, the upper management of the RSPA and the MTB believe the current staff is sufficient, and no requests for additional staffing are being made to Congress.

b. The Natural Gas Pipeline Safety Act of 1968

Before examining the pipeline data system as it presently exists, it is necessary to review several aspects of the Natural Gas Pipeline Safety Act of 1968 which have a direct bearing on the pipeline data system. First, not all pipeline systems are covered by the legislation. While, in general, gathering, transmission and distribution systems all fall within Federal jurisdiction, gathering lines in rural areas, outside the limits of a city, town, village, or other residential or commercial

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8/ Draft mission statement, from Office of the Director, MTB.

9/ A master meter system is a gas distribution system supplying gas to more than one user or outlet beyond the meter (i.e., apartment buildings, mobile home parks, shopping centers, hospitals, universities, etc.). Master meter systems are generally operated by companies or individuals whose main business is not the distribution and sale of gas.

area, are exempt from Federal regulation. 10/ Consequently, no data is collected by the MTB on rural gathering lines. It should be added that most gathering lines are in rural areas.

Second, while interstate pipeline facilities (with the exception noted above) are subject to Federal jurisdiction, the Act provides a mechanism whereby the States may assume all or partial responsibility for pipeline safety as related to intrastate systems. Under section 5(a) of the Act, a State agency, usually a public service commission, may regulate its intrastate pipeline facilities if it submits to the Secretary of Transportation an annual certification. By this process the State agency certifies that it:

> (1) has regulatory jurisdiction over the safety standards and practices of [its intrastate] pipeline facilities and transportation of gas
>
> (2) has adopted each Federal safety standard applicable to such pipeline facilities and transportation of gas established under [the] Act as of the date of the certification
>
> (3) is enforcing each such standard, and
>
> (4) has the authority to require record maintenance, reporting, and inspection substantially the same as are provided under [appropriate sections of the Act].

In addition, State law must provide for the enforcement of the safety standards of such State agency by way of injunctive and monetary sanctions.

A second type of agreement between the States and Federal government may be established under section 5(b) of the Act. In this case, those State agencies which cannot, or do not wish to, provide for the enforcement of the safety standards for their intrastate pipeline systems, may nonetheless assume responsibility for monitoring and inspecting such facilities. Under a 5(b) agreement, a State agency agrees to:

> (1) establish an adequate program for record maintenance, reporting, and inspection designed to assist compliance with Federal safety standards, [and]
>
> (2) establish procedures for approval of plans of inspection and maintenance substantially the same as are required [by the Act].

10/ In order to extend Federal protection to pockets of population in rural areas, the Secretary of Transportation is given authority to define, as circumstances require, what is a "nonrural" area (i.e., an area where Federal pipeline safety regulations do apply). The legislative history of the Act states:

> The committee wishes it to be clear that its thought as to a populated area does not mean that it must be one with a total of a large number of people. It is evident that to a few the safety standards pertaining to a pipeline passing near their houses, their school, or their place of employment is of as much concern as though they were part of a large group.

Under such agreement, the State agency must promptly notify the Secretary of any violation or probable violation of a Federal safety standard which is discovered as a result of its program.

Any State program established either by 5(a) certification or 5(b) agreement is subject to monitoring by the Secretary to assure that such programs are being carried out in compliance with the certification or agreement. In 1977, 46 State agencies filed 5(a) certifications 11/ and 7 States entered into 5(b) agreements.

Finally, a third relationship between States and Federal government occurs in certain cases where the State agency has voluntarily agreed to conduct surveillance of interstate pipeline facilities as an agent of the DOT. In 1977, 14 States had such agreements with the DOT.

Thus, while the DOT is responsible for the safety of nearly all gas pipeline systems, there exists a complex pattern for jurisdictional control over pipeline operators. It is further complicated by variation within States. For example, Arizona has jurisdiction over municipally owned distribution systems but not over master meter operators. Delaware, on the other hand, controls master meter operators, but not municipally owned distribution systems. Indiana has jurisdiction over both, while Kentucky has jurisdiction over neither. As a result of jurisdictional variation between States, the MTB regional offices differ in the types of operators for which they are directly responsible, and on which they can collect information directly. While leak and annual reports are required by the MTB from pipeline operators, regardless of whose jurisdiction within which they fall, other information, such as that resulting from monitoring and inspection activities, may be collected by various agencies, each using somewhat different procedures. Such data are seldom located centrally for any uniform strata of operator or pipeline system types, and are seldom uniform in either format or quality.

III. THE GAS PIPELINE DATA SYSTEM

The largest body of gas pipeline data collected by the MTB results from the requirements set forth in 49 CFR 191. Part 191 prescribes the reporting of "gas leaks that are not intended by the operator and that require immediate or scheduled repair and of test failures. . . ." Three types of reports are described in the regulation--telephonic notifications of leaks, written reports of leaks, and written annual reports. Each of the three reports applies to a somewhat different population of operators and incidents which are defined in each case by criteria set forth in Part 191. As noted above, the reporting requirements do not apply to leaks and test failures which occur in rural gathering lines.

All operators must give notice by telephone as soon as possible after the discovery of certain leaks. Such leaks include those which:

(1) cause a death or personal injury requiring hospitalization
(2) require the taking of any segment of transmission pipeline out of service

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11/ These included the District of Columbia, Puerto Rico, and two agencies in Florida.

(3) result in gas igniting
(4) cause damage to the property of the operator or others estimated at $5,000 or more
(5) in the judgment of the operator, are significant, even though they may not meet criteria (1) to (4). 12/

The information given in a telephonic notification is to include the time and location of the leak, fatalities and injuries, if any, and other significant facts that are known and relevant to the cause of the leak.

The telephonic notification itself is made to the National Response Center operated by the Coast Guard. 13/ On a daily basis, these data are collected by MTB's Safety Data Management Branch and are computerized. A printout of the leak notifications (approximately 7 to 10 occur each day) is forwarded daily to the OOE. Approximately once a month, a printout of telephonic notifications is forwarded to the five regional offices. In addition to the basic data obtained in the notification, this printout indicates whether a written leak report will be required for an incident, or whether a written report is overdue.

Written leak reports are required in certain cases within 20 days of detection of a leak. However, requirements differ for operators of distribution systems and those operating transmission and gathering systems. In the case of distribution systems, a written report must be made for any leak which requires a telephonic notification or which, because of the location, requires "immediate repair and other emergency action to protect the public such as evacuation of a building, blocking off an area, or rerouting of traffic." However, only operators of distribution systems serving more than 100,000 customers are required to make written reports of such leaks.

For transmission and gathering systems (excepting, as noted above, gathering systems in rural areas), a written leak report is required from all operators when the following types of leaks are detected:

(1) a leak requiring telephonic notice
(2) a leak in a transmission line that requires immediate repair
(3) a test failure that occurs while testing either with gas or another test medium.

Written leak reports for both distribution and transmission/gathering lines are made on standardized DOT forms (DOT F7100.1 "Leak Report-Distribution System" and DOT F7100.2 "Leak Report or Test Failure - Transmission and Gathering Systems." See appendix.) While the two forms are not identical, approximately 90 percent of the data required by each is the same. The remaining 10 percent reflects generic differences between distribution and transmission/gathering

12/ Operators need not give telephonic notice in the case where criteria (2) or (3) occur solely as a result of planned or routine maintenance or construction.
13/ In a letter to all operators of gas pipeline facilities dated January 29, 1971, the Acting Director of the Office of Pipeline Safety stated that "in most cases this telephonic report can and should be made within one to two hours after discovery." This position was reaffirmed in an OPSO Advisory Bulletin of March 1977.

systems. Information required by the forms for the most part involves short answers or checking boxes; therefore, within each of the two leak reports the data are, in format, relatively uniform and easily comparable. The data include where and when the incident occurred, part of the system which leaked or failed, pipe material and specifications, method of leak detection and type of repair, fatalities and/or injuries, damage estimates, environment of the incident, and additional information concerning failures due to corrosion, damage by outside forces, or construction defect or material failure.

The leak report forms (approximately 2,000 per year) are mailed directly to the MTB's Safety Data Management Branch. The forms are quickly scanned, then forwarded to the TSC where a contractor computerizes the data. On-line storage of the data makes them available continually to the MTB and tapes of the data (compiled annually) can be purchased by the public. The original leak reports are returned to the MTB and stored.

Title 49 CFR 191 also requires annual reports for distribution systems and for transmission and gathering systems (DOT F7100.1-1 "Annual Report for Calendar Year 19___ Distribution System," and DOT F7100.2-1 "Annual Report for Calendar Year 19___ Gas Transmission and Gathering Systems." See appendix.) Annual reports must be submitted by all operators, with the exception of distribution system operators of petroleum gas systems which serve less than 100 customers from a single source. The annual report forms, like the leak report forms for distribution and transmission/gathering lines, are largely similar, though not identical. The information requested is almost entirely quantitative, and includes data on miles of pipe and number of services; age of various types of pipe; miles of cathodically protected pipe; location, cause, and number of leaks repaired; number of fatalities, injuries and amount of property damage; and frequency and type of leak surveys. The forms are to be submitted by February 15 for the preceding calendar year, and are collected by the Safety Data Management Branch. Over 4,500 such forms are received each year. These are forwarded to the TSC where the data are validated and computerized. The data are thus available on on-line storage, as well as on tapes, copies of which can be purchased. The original reports are returned to the MTB and stored.

Automation of the telephonic, leak, and annual reports consists of entering the raw data from the forms into a computer. The data are maintained as three separate files; they are not integrated together, or with other data. At present, no programs are run which, on a regular basis, generate statistics from the raw data.

Several additional types of pipeline data are collected by the MTB in the course of its regulatory and enforcement activities. While these are not as uniform in format as the leak or annual reports, they do constitute a store of information which is available to the MTB.

As discussed above, the Natural Gas Pipeline Safety Act of 1968 permits State agencies to file Section 5(a) certifications or enter into Section 5(b) agreements with the Secretary of Transportation. A State agency which files a 5(a) certification or 5(b) agreement is eligible to apply for a grant-in-aid of up to 50 percent of the cost of carrying out the pipeline safety program. Each State jurisdiction files a 5(a) certification, makes a 5(b) agreement, or applies for a

grant-in-aid by annually submitting certain data to the MTB. Data which must be submitted on the 5(a) or 5(b) forms include the following:

(1) a tabulation of the types of interstate gas facilities over which the State does and does not have jurisdiction

(2) a list of operators subject to the State agency's jurisdiction

(3) a list of pipeline accidents including numbers of injuries requiring hospitalization, number of fatalities, amount of property damage (exceeding $1,000), name of company, and causes; all available reports concerning the State agency's investigation of each accident are to be attached

(4) a summary of the State inspection and compliance actions, including number of operators inspected, enforcement actions taken, and penalties assessed

(5) a list of records maintained by the State agency pertaining to its gas pipeline safety program, and a list of pipeline safety reports required by the State agency from operators over which it has jurisdiction, and

(6) a list of State employees involved in the pipeline safety program, including the percentage of time each is involved with pipeline safety.

The file on each State agency also contains applications for grants-in-aid. Such applications require a general description of the agency's safety program, as well as detailed budgetary information. In addition, the file contains the results of periodic inspections of the State agency which are carried out by the OOE's regional pipeline officers. Inspectors from the regional offices monitor the programs of the State agencies with 5(a) certifications or 5(b) agreements and complete a form which awards points to the agency based on a series of criteria, in effect "grading" the agency's program. While some of the questions on the inspection form award points on an objective basis, most of the questions require subjective judgments on the inspector's part and thus limit the potential for quantification of such data. The regional office retains a copy for its records and a copy is also on file with the Pipeline Safety Enforcement Division along with the 5(a) certification or 5(b) agreement.

These data associated with State agency activities in pipeline safety are maintained by MTB's Pipeline Safety Enforcement Division. The information is not automated, nor published, though it is available to the public.

A second file of data maintained by the Pipeline Safety Enforcement Division contains records of actions taken when an operator is found to be in violation of pipeline safety regulations. When a case of noncompliance with regulations is found by an inspector, the OOE regional chief issues a "notice of probable violation" which describes the regulation violated and notifies the operator of the potential penalty. This action triggers the opening of a Compliance Progress File, containing a copy of the notice of probable violation, a violation report (a detailed explanation of the violation derived from the inspection of the pipeline system), and whatever documentation is thereafter generated as the case develops. Both the regional office and the OOE maintain a copy of the Compliance Progress File.

Beyond certain general similarities in f[illegible]t, these data are not uniform or standardized. In addition, like the 5(a) certifi[illegible]n and 5(b) agreement data, they are not automated, though they are open to the public after a case has been closed. 14/

Finally, some cumulative data resulting from pipeline safety enforcement activities are available to the MTB. For example, the OOE's regional offices maintain files on their inspection activities. Monthly activities reports from the regions summarize the month's inspection program, detailing the sections of the pipeline regulations for which violations have been found, and types of action taken. These monthly reports thus constitute a summary of some information contained in the Compliance Progress Files.

Another source of data, external to the MTB (though, by law, accessible to it) is the records of inspection and enforcement actions undertaken by State agencies with either 5(a) certifications or 5(b) agreements. Certain data from these records are summarized annually by the State agency when it files a 5(a) certification or 5(b) agreement and the records themselves are inspected periodically as a part of the MTB's enforcement activities. The State records vary widely in format and completeness from State agency to State agency, however, and none of these data are computerized.

IV. CURRENT USE OF THE PIPELINE DATA SYSTEM

The only use of the pipeline data which is required either by regulation or internal policy is the preparation of an annual report. The Natural Gas Pipeline Safety Act of 1968 requires a "comprehensive report on the administration of the Act," and lists 11 specific topics which must be covered. Pipeline data must be collected and summarized for this purpose. At present, however, the latest report available is for calendar year 1977. The report for 1978 has been completed but not published; the 1979 report has not yet been completed.

As noted above, the Safety Data Management Branch is responsible for processing the data acquired through telephonic, leak, and annual reports. When data from these sources are needed, a request is made to this branch. The branch does virtually no analysis of the data, but rather collects and enters the information in automated files making it available upon request. The branch's pipeline data responsibilities are carried out by three persons, including the branch head who has additional responsibilities as well.

Interviews with MTB pipeline officials, as well as review of relevant files, clearly indicate that the data described above are only minimally used by the MTB in the course of its regulatory and enforcement activities. Records for the past year indicate that approximately 75 percent of the requests to the Safety Data Management Branch for pipeline data come from outside the MTB. These sources include Congressmen, attorneys, insurance firms, journalists, and public interest groups. Federal agencies such as the NTSB and the Federal Energy Regulatory Commission also request data. Generally, either information on a specific

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14/ Documents pertaining to cases still in progress may also be made available if specifically requested under the Freedom of Information Act. The decision to open such files is made by the RSPA's legal office.

pipeline incident or basic descriptive statistics are asked for. The NTSB, in its accident investigations, may request data from the OOE on compliance checks made by regional offices on a particular operator. Though some of these external requests are made under the Freedom of Information Act and therefore must be addressed immediately, in general all requests for data are expeditiously handled by the Safety Data Management Branch.

Far fewer requests for data come from in-house sources where use of the data system is infrequent and irregular. During the past year, a total of about two dozen data requests have been made by either the pipeline regulatory or enforcement offices. 15/ Requests from the staff of the regulations office have included: a list of distribution operators with cast-iron mains; data on plastic pipe failures by cause by year; the number of gas services for a dozen specific operators; a breakdown of percentage of operators by number of customers served; distribution system failure statistics for material failures by size of company. The pipeline enforcement office appears to ask for data less often, requesting specific leak reports in a majority of cases. Requests by the regulation and enforcement offices are not for comprehensive amounts of data, and thus, obviously, comprehensive portions of the data are not analyzed by these offices. Requests are made infrequently, and MTB staff indicated that analysis of data from the pipeline data base rarely, if ever, served to actually generate either regulatory or enforcement action.

While the Safety Data Management Branch responds to requests and does not analyze pipeline data, some efforts have been made by the branch to provide other MTB pipeline offices with data not specifically requested. During the past year, the Safety Data Management Branch has compiled periodic summaries of telephonic reports, forwarding them, along with copies of individual leak reports, to the regional offices. At least one region then forwards a copy of the telephonic report on to its State agencies. The reports are used by the regions and States to assure that they are aware of incidents within their respective jurisdictions.

In addition, the TSC has recently prepared for the Safety Data Management Branch a voluminous compilation of data from 1978 annual reports. This volume, which presents essentially a collection of raw data with little analysis, presents a national summary of the data, followed by regional and State breakdowns. It is currently in a draft form being reviewed within the MTB for its usefulness, or potential usefulness, to the regulation and enforcement offices.

To a limited extent, the pipeline enforcement regional offices use the data they collect in the course of inspections and compliance violation cases. Records are kept and checked by staff members in the course of daily activities. However, neither the files on State programs nor the compliance progress files are regularly analyzed. Regional enforcement officials indicated that since nearly 50 percent of their time is spent traveling, they have little time for such analysis in any case. Recently, some data from these files were gathered for discussion at a quarterly meeting of regional chiefs. This included tabulations of State inspection activities, personnel resources and qualifications by State, the results of OOE inspections of the State agency programs, and a summary by region of the sections of the pipeline regulations which had been violated.

15/ Requests may be formal or informal (i.e., by memo or telephone). Program Development keeps a record of all, or nearly all, requests of both types, however.

The NTSB questioned MTB officials concerning coordination between the various pipeline offices regarding use of the data system. The Safety Data Management Branch stated that it regards its function as responding to requests by the other pipeline offices. The division does not believe that it has the capability for data analysis, nor does it see itself responsible for suggesting or determining the data needs of the other two offices. It has issued requests for an explication of data needs to both offices, but indicated that it is difficult to get feedback from either one.

Officials in regulations and enforcement offices generally agreed that the Safety Data Management Branch's job is to provide the data they need, and they indicated that they had communicated to the branch some of these needs. However, while acknowledging their own responsibilities regarding use of the data system and its potential benefits, officials of both regulations and enforcement offices expressed reservations about the utility of the data and of time spent planning uses of the data system. Regulations and enforcement officials pointed to the unreliability of the date, citing the Safety Data Management Branch's inability to accurately validate and process the information. Also, officials pointed out their own limited staffs and the extensive requirements on their time. One official noted that the highest priority for his office work had to go to carrying out the required daily functions of the office; developing improvements in the data system simply had a low priority due to limited resources.

V. PAST EVALUATION OF THE PIPELINE DATA SYSTEM

The DOT established pipeline data reporting requirements in 1970 as authorized by the Natural Gas Pipeline Safety Act of 1968. A variety of organizations, however, soon began to point out inadequacies in the data being collected, and to suggest the need for revision of the data forms and reporting requirements. The NTSB, in August 1973, for example, recommended that the MTB "improve the accident-reporting requirements in order to obtain a better understanding of the causes of failures of cast-iron mains." 16/ As a result of such recommendations from the NTSB as well as comments from pipeline industry organizations, the MTB contracted with the University of Oklahoma for an analysis of the pipeline data system, "to identify any problems with the data reporting forms and any data need not currently being met by the existing system." 17/ The study, which was completed in October 1974, made recommendations concerning both the data system itself and the uses to which it was being put. Related to the reporting forms, the study concluded that:

- the exclusion from leak reports of distribution operators with less than 100,000 services [49 CFR 191.9(a)] seriously limited the use of the data system

- significant problems of data accuracy exist for 1970 data, and, to a lesser extent, for 1971, 1972 and 1973 data

16/ NTSB, "Pipeline Accident Report--Atlanta Gas Light Company, Atlanta, Georgia, August 31, 1972 "(NTSB-PAR-73-3) August 16, 1973; recommendation P-73-37.
17/ "Analysis and Management of A Pipeline Safety Information System," University of Oklahoma, January 1975, Report No. DOT-TST-75-47 (Contract No. DOT-OS-30110), p. 2.

- other methods of collecting data should be explored, such as indepth accident investigation by multidisciplinary teams, similar to that done by the NTSB

- the data forms need to be changed.

Concerning MTB uses of the data, the report recommended that:

- individual leak report data should be utilized annually to compare the safety performance of individual operators

- annual report and leak report data should be analyzed statistically at least every 2 years

- after 7-10 years of data have been collected, consideration should be given to use time-trend analysis on a yearly basis.

The study also concluded that, because of low anticipated use, it appeared unwarranted to recommend installation of a computer terminal in the OPSO for the purpose of performing data analyses. 18/

Following the University of Oklahoma report, the OPSO began revising its pipeline data forms. During 1975, 1976, and 1977, revisions were discussed among OPSO staff members and comments were solicited from State agencies, from industry and industry-related organizations (such as the American Society of Mechanical Engineers Gas Piping Standards Committee), and from the NTSB. The NTSB commented in a letter of February 23, 1977, which addressed the exemption from written reporting requirements of distribution system operators with less than 100,000 customers. The NTSB stated:

> We believe that DOT Form F 7100.1, Leak Report-Distribution System, should be filed by all gas distribution systems regardless of the number of services operated by the system. . . . Our investigative experience indicates that major accidents occur in systems with less than 100,000 services almost as frequently as in systems with 100,000 or more services.

The NTSB reiterated this suggestion and offered further, more extensive comments in a letter of March 22, 1977. In this response, the NTSB identified 128 data entry blocks which it found to be unnecessary; made suggestions intended to clarify to the operator exactly what information is desired; and made comments aimed at "making the requested data more useful in evaluating reported incidents. . . ."

In June 1978, the MTB published an NPRM proposing revision of the pipeline reporting forms, to "facilitate data processing, provide more appropriate data or data needed to administer new or amended statutes, and be easier to understand." 19/ The NPRM proposed to extend reporting requirements to rural

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18/ Ibid., p. 4-5.
19/ 43 FR 24478, June 5, 1978.

gathering lines in response to a 1976 recommendation by the NTSB, 20/ and to revoke the exemption for small petroleum gas systems from annual reporting requirements. Also, abbreviated annual reporting requirements were proposed for distribution systems with fewer than 2,500 customers. The proposed effective dates for the revised forms were January 1, 1979, for Leak Reports and February 15, 1980, for Annual Reports.

The NPRM generates a variety of comment, including responses by State public service commissions, gas companies, industry organizations such as the American Gas Association and the American Petroleum Institute, and the NTSB, which again offered specific suggestions on the proposed revisions. In particular, the NTSB stated:

> Changes to the existing annual and individual report forms should have been developed based on a plan for analysis. Through conversation with Office of Pipeline Safety Operations staff, it was learned that no plan for analysis has been developed. 21/

Following the 1978 NPRM, revisions to the forms were discussed within the MTB. In particular, it was decided to consolidate onto a single form the individual leak report data for both distribution and transmission/gathering lines. While separate annual report forms were retained for distribution and transmission/gathering lines, the MTB devised a shortened annual report form for distribution system operators with less than 2,500 services.

At present, work has not progressed beyond this stage. The proposed forms are still in a rough format being worked on within the MTB. They have yet to be put in final form or approved by the Office of Management and Budget. The staff member responsible for the forms told the NTSB that a final rule on the data forms was tentatively scheduled to be issued by November 1980. It was not known whether leak reporting requirements would be extended to rural gathering lines or to smaller distribution system operators.

The NTSB's evaluation revealed that no plan for data analysis has been developed by the MTB during the past 2 years to assist in developing new data forms. Interviews with the staff member who had primary responsibility for developing the new forms, as well as with the former head of the Office of Pipeline

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20/ NTSB, "Pipeline Accident Report--Texas Oil and Gas Corporation, 6-inch Natural Gas-Gathering Pipeline Failure, Meridian, Mississippi, May 21, 1974" (NTSB-PAR-76-1) February 4, 1976. The recommendation to the DOT stated:

> Promulgate regulations under the Hazardous Materials Transportation Act for natural gas-gathering pipelines in rural areas, similar to the regulations promulgated for natural gas transmission and distribution pipelines in 49 CFR 192. (P-76-5)

In a reply to the NTSB of June 17, 1976, the MTB Director said that the MTB proposed, before issuing regulations, to extend the reporting requirements to rural gathering lines in order to collect data to assess the safety problem.

21/ NTSB letter dated July 10, 1978, to MTB Docket No. OPS-49; Notice 1.

Safety Regulations, indicated that development of changes in the forms was done primarily by attempting to establish a "consensus" on the various aspects of the forms which needed modification. Comments were reviewed by an ad hoc committee of MTB staff, and an effort was then made to establish a consensus on various specifics related to the data form. The difficulty of reaching a consensus was cited as one reason for the slow movement of efforts to change the forms.

The MTB has recently made some efforts to plan uses of its pipeline data. A 1979 enforcement office memorandum 22/ suggested various data needs and potential uses for the data system. The memorandum stated that some basic statistics must be generated on a regular basis so that comparisons can be made. These might include leak rates for a variety of categories, such as types of pipeline, size of operator, or type of operator (i.e., municipality, master meter, etc.). The memorandum added that other data must be automated, including information identifying whether an operator is under State or Federal jurisdiction, and data relating to past inspection and enforcement activity.

The OOE memorandum stated that a primary use of a data system should be to provide "the necessary data to assist the OOE's regional pipeline inspectors in conducting their inspection program." Some efforts have been made in the past toward devising a procedure for selecting the operators to be inspected. An OOE manual presents a formula which attempts to determine the potential risk of an operator's system, based on data from the leak and annual reports. The validity of this formula has been debated within the OOE, however, and it is not currently being used.

In 1978, problems with the pipeline data system much like those identified by the 1974 University of Oklahoma study were again raised in reports from three separate sources.

First, in April 1978, the General Accounting Office (GAO) issued "Pipeline Safety--Need For A Stronger Federal Effort," a study which identified a number of significant problems and weaknesses in the pipeline safety program. One of the GAO's findings related directly to the pipeline data system. The study concluded that the OPSO had not developed an effective data collection and analysis system, and that only limited use had been made of the data which had been accumulated. The report recommended that the Secretary of Transportation direct the OPSO to develop a more comprehensive data system and use it in administering the Federal pipeline safety program.

Second, in October 1978, the NTSB published the results of a special study entitled "Safe Service Life For Liquid Petroleum Pipelines." 23/ Though the report dealt with liquid pipelines, it found problems in the OPSO data system similar to those identified by the 1974 University of Oklahoma report and 1978 GAO study on gas pipeline data. The NTSB recommended that the OPSO:

22/ MTB, Office of Operations and Enforcement, "Work Statement for Establishing a Management Information System for the Office of Operations and Enforcement (OOE)," (undated), 2 pp.

23/ NTSB, "Safe Service Life For Liquid Petroleum Pipelines" (NTSB-PSS-78-1) October 12, 1978.

> Publish a plan that describes how the OPSO will use accident report data to formulate safety regulations and to develop a safe service life model for pipelines. (P-78-58)

The MTB responded to the NTSB recommendation in February 1979, stating that the Bureau would include discussion of its plans for relating accident data to safety regulations in future issues of its Pipeline Safety Advisory Bulletin. The MTB also stated that it was "not prepared to speculate in a published plan as to how the accident report data might be used to develop a service life model for pipelines." 24/

Finally, in September 1978 the DOT completed a "Report of the Hazardous Materials Transportation Task Force." While not dealing specifically with the pipeline program, the study recommended:

> That a centralized hazardous materials information system be established within the Department to collect and analyze hazardous materials program information. This information system should be carefully designed to record the significant characteristics of [DOT's] programs in order to assist in the Department's planning, regulatory and compliance efforts. 25/

Thus, almost 4 years after the University of Oklahoma report on the pipeline data system, other analyses were reidentifying essentially the same problems. These later studies, published at approximately the same time as the NPRM proposing changes in the data forms, emphasized the limited use made of the data and the absence of a comprehensive plan to identify specific data needs and direct data use.

During the past 2 years, the MTB has responded specifically to the DOT Task Force's recommendation by initiating development of a Hazardous Materials Information System (HMIS). 26/ The system will centralize data on hazardous materials across all transportation modes, including pipeline, and its purpose will be to

> improve DOT's capability to administer an effective program of regulation and enforcement which will minimize the risk, injury, and loss associated with the transportation of hazardous materials of all types, for all modes, including pipeline. An important corollary general goal and objective of this system is the establishment of priorities and programs which will permit the most effective and efficient use of DOT's and especially MTB's limited resources. 27/

24/ MTB letter to NTSB dated February 1, 1979. Based on this response, the Safety Board has classified the current status of this recommendation as "Open-Unacceptable Action."

25/ DOT, "Report of the Hazardous Materials Transportation Task Force," September 1978, p. xiv.

26/ HMIS is to be part of a broader DOT-wide information system administered within the RSPA by an Office of Transportation Information Policy and Standards.

27/ MTB draft, "Preliminary Requirements Analysis for the Integrated Hazardous Materials Information System," p. 15.

A Preliminary Requirements Analysis identifying, in general terms, the functions of an HMIS and the types of data needed, was completed in early 1980, and a draft is currently being reviewed within the RSPA. As part of the HMIS, the TSC now automates both leak and annual pipeline reports (validating the latter), and has worked with the Safety Data Management Branch to improve the quality of the data currently collected.

The development of the HMIS, however, is in its initial stages. In the future, if the system develops as planned, the TSC will analyze more specifically the pipeline data system. At present, the TSC's efforts have not dealt with modifying the pipeline data system (i.e., revising the data forms, automating data in addition to the telephonic, leak, and annual reports, or developing a plan for data analysis) but have focused on computerizing data which are currently collected.

Finally, it should be pointed out that the MTB is preparing a cost/benefit analysis on several issues related to the pipeline data system. The report is required by Section 110 of the Pipeline Safety Act of 1979, and will include analysis of the cost-effectiveness of establishing an electronic data-processing system to process and maintain pipeline safety information, and whether it is necessary and cost-effective to amend existing Federal law and regulations on the reporting of pipeline leaks.

VI. ANALYSIS

The NTSB believes that the pipeline data currently collected by the MTB are neither accurate nor reliable enough to provide the Bureau with a "sound statistical base with which to define safety problems, determine their underlying causes, and propose regulatory solutions." 28/ The problems with the pipeline data have been extensively documented over the past 8 years by a variety of organizations including the University of Oklahoma, the GAO, the DOT, and the NTSB.

Examples of deficiencies in the data collected in accordance with 49 CFR 191 include the following:

(1) The data forms themselves do not request sufficient information to allow accurate identification and analysis of safety problems. For example, on the leak report form, no information is requested regarding the cause of reported material failures. In addition, these forms do not collect information on deficiencies in operator procedures or on employee errors which may have caused the incident.

(2) The data forms are not filled out uniformly by operators. In some cases, operators do not know the information requested (for example, the date of construction of the pipeline system), or operators may leave data entries blank. In other cases, the data supplied are inaccurate (as when subtotal columns do not add up to the given total).

28/ From notice establishing data reporting requirements, 35 FR 317, January 8, 1970.

Some operators do not understand the forms or exactly what information is expected by the MTB. While instructions accompany the annual report forms, some operators either do not follow the directions or do not understand them. No instructions to aid the operator accompany the individual leak report forms. One specific reason for the need for explicit directions is that the meaning of some pipeline terminology is not uniform or universally accepted across the pipeline industry.

(3) The data forms are not adequately validated by the MTB's Safety Data Management Branch. In a recent NTSB review of over 500 leak reports concerning plastic pipe, 33 percent of the reports reviewed did not indicate the type of plastic involved in the incident. There was no evidence that the MTB had taken action to require that these data be reported by the operators involved.

(4) The data are not representative of all gas pipeline operators and gas pipeline accidents, and it appears that safety problems do exist in areas on which pipeline data are not collected by the MTB. The reporting requirements set forth in 49 CFR 191 do not apply to rural gathering lines. As a result of a gathering line failure in Meridian, Mississippi, in 1974, the NTSB recommended that regulations for rural gas gathering lines be developed (see p. 15, footnote 20). Since this accident, the NTSB has investigated 10 rural gathering line accidents which have caused a total of 25 fatalities.

Leak reports are not required from distribution system operators with less than 100,000 customers, regardless of the magnitude of the accident. 29/ The 1974 University of Oklahoma report concluded that this "seriously limited the use of the data system." The NTSB stated in a letter to the MTB in February 1977 that its investigative experience indicated that major accidents frequently occur in systems with less than 100,000 services.

The criteria which define a serious leak requiring a leak report eliminate from any detailed reporting the vast majority of leaks. The 2,000 leak reports per year received by the MTB represent only a small percentage (about 0.2 percent) of the more than 840,000 leaks reported to have been repaired by all operators during 1978. 30/ About 4,500 annual reports are received by MTB from all operators. There are estimated to be nearly 29,000 master meter operators, all of whom are

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29/ Distribution system operators with more than 100,000 customers constitute approximately 10 percent of the total number of operators and service about 90 percent of the total gas customers.

30/ "Natural Gas Pipeline Statistics," Annual Report for 1978 (DOT-TSC-RSPA-80-2) April 1980, pp. 2-5, 2-21.

> required to file annual reports. 31/ The MTB is currently attempting to identify master meter operators who do not file annual reports. Since, with its present staffing, the Safety Data Management Branch would be unable to handle thousands of additional annual reports, it would seem that an effort to increase reporting by these operators would better be deferred until data needs from master meter operators are established. At present, the MTB does not know to what extent safety problems exist within this group of operators.

The MTB has recognized the inadequacy of the leak and annual report data at least since 1973, when it commissioned the University of Oklahoma study. Yet since that time, the MTB has failed to implement improvements. While work has progressed on changing the data forms, the MTB has not committed itself to a timely completion of this task, and modification of the reporting requirements has yet to take place. As a result of this failure to act, the same data which were recognized as inadequate 8 years ago are still being collected today. Such deficiencies in the data have been cited as a major cause of the irregular and infrequent use of the system by MTB regulations and enforcement staffs.

A second and perhaps more important deficiency lies in the MTB's failure to develop a plan for data analysis prior to beginning revision of the data forms. The purpose of such a plan for data analysis would be:

- to identify the questions which MTB pipeline offices need to answer to better carry out their regulatory and enforcement activities
- to specify what data are needed to answer these questions
- to define how these data are to be collected and analyzed, and
- to describe who is responsible for these various tasks.

In its comments to the MTB's 1978 NPRM proposing changes in the data forms, the NTSB stated:

> Changes to the existing annual and individual report forms should have been developed based on a plan for analysis. Through conversation with Office of Pipeline Safety Operations staff, it was learned that no plan for analysis has been developed. 32/

31/ MTB, Office of Operations and Enforcement, "Annual Report, Fiscal Year 1979," p. 8, uses the figure 28,900 master meter operators in the five regions. However, a study recently prepared for the DOT, using a sampling and extrapolation technique (and considering only a subset of all master meter operators), estimates over 80,915 master meter operators in the U.S. See Gregory C. Grapsas and Thomas W. Caless, "An Analysis of Natural Gas Master Meter Systems (Definition and Program) From a Federal Perspective," (DOT-RSPA-MTB-79-5), June 15, 1979, p. 5-17.

32/ NTSB letter to MTB docket, OPS-49; Notice 1, dated July 10, 1978. A similar recommendation resulted from a 1978 special study on liquid gas pipelines (see page 16 above and footnote 23).

No such data analysis plan has been developed by the MTB during the past 2 years. While the development of the HMIS, and assistance by the TSC in this effort, has improved the accessibility of the pipeline data, this program has not dealt with improving the data which is collected or with the creation of a data analysis plan. The work accomplished so far to modify the data forms has been done without a plan identifying exactly what data are needed, what they are needed for, and from whom these data must be acquired. Instead, the MTB has solicited outside comment, and then, with its own staff, has attempted to establish a consensus on specific aspects of the data forms.

Suggestions from outside organizations are essential to the development of changes in the data forms. However, the NTSB believes that the interests of industry or other organizations and the concerns of the MTB are not the same, and that consensus, while it may be a part of developing modifications in the data system, is not alone an adequate mechanism for the MTB to have used to establish an improved data system. In particular, it cannot provide a coherent organization for the whole system, nor can it act as a substitute for the systematic and explicit expression by the MTB of its data needs.

The NTSB believes that development of changes in the data system has been and will continue to be seriously flawed without a data analysis plan to provide organization and unity. Such a plan should be immediately developed by the MTB. The Board further believes that the MTB must postpone its publication of revised data forms and reporting requirements until such a plan has been formulated and the proposed changes coordinated with it.

A data analysis plan would function to help the MTB deal with a variety of problems regarding its data system. For example, such a plan would ensure that the data collected accurately reflect all pipeline operators and accidents, thus furnishing the MTB with information on all significant problem areas. While the MTB has acknowledged voids in the data, no significant effort has been made to determine whether safety problems exist in the systems either exempted from reporting or simply failing to report. Part of the purpose of a data use plan would be to provide criteria to plan analyses of these issues. For certain strata of operator types, small distribution companies, or master meter operators, for example, a sampling procedure might be most appropriate to determine safety needs or the propriety of more extensive reporting requirements. Decisions about what should be sampled and what the cut-off limits of certain reporting requirements should be (i.e., 100,000 or 2,500 customers serviced), should be based on a set of criteria derived from the pipeline offices' data needs. At present these criteria have not been formally articulated by the MTB. A data plan is required to meet this need.

In addition, a data analysis plan would help identify ways in which the data could be used to help the MTB more effectively manage its resources. Such management uses of the data could include:

(a) identification of pipeline operations which pose the greatest risk to the public safety and on which the MTB and States should concentrate their inspection and enforcement activities

(b) determination of the frequency and type of inspection activity to be conducted on an operator

(c) evaluation of the adequacy of action taken by States holding 5(a) and 5(b) certifications

(d) determination of the effectiveness of pipeline safety regulations and identification of additional safety problems which require regulatory action.

Finally, it should be added that while the leak and annual report data collected over the past 10 years have been acknowledged to be deficient, they are far from being useless. The information is extensive, and that submitted by many companies is accurate and thorough. The MTB also has available to it other data such as the results of inspection and compliance violation actions by its own enforcement office and by the States. Part of the function of a data analysis plan would be to coordinate uses of all the current pipeline data based on the present needs of MTB offices, including the utility of integrating various data types and automating data files other than the telephonic, leak, and annual reports.

The NTSB believes that since the MTB staff will remain relatively small while the gas pipeline network is projected to grow during the next decade at the rate of over 30,000 miles per year, 33/ the need for a well managed data system is imperative. Not only must data serve to give the MTB an accurate and timely view of the pipeline industry, but the data system should serve also as a management tool to help the MTB guide and focus its limited resources on the most significant problems. In order for this to take place, however, there must be strong and unequivocal support for data system use by the MTB management.

In particular, organizational problems affecting the pipeline data system must be resolved. At present there is no single office which has the defined responsibility and authority for coordinating use of the data system or for planning improvement. The Safety Data Management Branch collects and processes the data and is developing the HMIS; the regulations office continues to work on modifications to the reporting forms; and the OOE is responsible for enforcing the reporting requirements currently in existence. The Safety Data Management Branch, which deals most directly with the pipeline data, is badly understaffed, and is part of an office and division both without directors or acting directors. Consequently, it is not able to provide the regulations and enforcement offices with adequate data or data analysis, and cannot rectify this situation without instructions from higher authority within the MTB. This, in turn, leads to a continued lack of cooperation between the three offices. The Safety Data Management Branch must respond to requests from regulations or enforcement offices which, in turn, are reluctant to request data in which they have little confidence.

It is necessary for the MTB upper management to coordinate the activities of the Safety Data Management Branch and the regulations and enforcement offices concerning the development and use of the pipeline data system. The NTSB is encouraged that the MTB is proposing a reorganization to create an Office of Regulatory Planning and Analysis, which will apparently be designed to focus more

33/ Pipeline and Gas Journal, May 1980, p. 22.

MTB resources on data processing and analysis. Both the speed with which this unit is created and its success within the MTB will depend heavily on support from the Bureau director and his staff, who must actively direct the participation in such a system of all the various pipeline offices. The NTSB urges the MTB to pursue the development of this office as quickly as possible.

VI. CONCLUSIONS

1. The data currently collected by the MTB are often inaccurate and are not representative of all gas pipeline operators and gas pipeline accidents. The MTB does not carefully validate the leak reports received.

2. A major reason for inaccuracies in the data is the lack of explicit instructions to operators for completion of all reporting forms.

3. The present data system is seldom used by MTB pipeline offices in carrying out their regulatory and enforcement functions.

4. The data system is used primarily to fill external requests for information, with irregular and infrequent requests for data made by individual MTB staff.

5. Inadequacies in the pipeline data system have been pointed out to the MTB in the past. The MTB has responded slowly to such criticisms, and has been developing new reporting forms for over 6 years. To date, however, no changes have been implemented.

6. The Safety Data Management Branch, which is responsible for data collection and processing, is understaffed and without a clear definition of its function within the MTB.

7. There is little cooperation or coordination regarding the data system between the Safety Data Management Branch and the regulations and enforcement offices.

8. MTB staff resources are limited and, consequently, use of the pipeline data to direct and focus resources is essential for the effective and efficient administration of the Pipeline Safety Act of 1979.

9. The MTB does not have a pipeline data analysis plan. The development of the HMIS has not included such a plan.

10. A data analysis plan is necessary to coordinate and direct the MTB pipeline offices in the use of the data system as a management tool.

11. A data analysis plan must precede revision of the reporting requirements and data forms to guide the selection of data collected and to assure that it is provided in a useable form.

12. The MTB upper management must make a strong committment to developing an improved data system and coordinating its use. This must include strengthening the MTB unit responsible for data processing and analysis.

VII. RECOMMENDATIONS

As a result of this evaluation, the National Transportation Safety Board recommended that the Materials Transportation Bureau of the Research and Special Programs Administration of the U.S. Department of Transportation:

Develop and publish for public comment a formal data analysis plan for the pipeline data system. (Class II, Priority Action) (P-80-61)

Expedite the proposed creation of an Office of Regulatory Planning and Analysis and define responsibilities for development and management of a pipeline data analysis plan. (Class II, Priority Action) (P-80-62)

Postpone promulgation of proposed, revised pipeline data forms until development of a data analysis plan and coordination of the forms with the plan. (Class II, Priority Action) (P-80-63)

Develop explicit directions for completion of the present data forms to improve the quality of the information collected on these forms. Assure that terms not universally accepted across the pipeline industry are defined. (Class II, Priority Action) (P-80-64)

Train existing personnel to more effectively validate incoming leak report forms. (Class II, Priority Action) (P-80-65)

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ JAMES B. KING
Chairman

/s/ PATRICIA A. GOLDMAN
Member

/s/ G. H. PATRICK BURSLEY
Member

ELWOOD T. DRIVER, Vice Chairman, and FRANCIS H. McADAMS, Member, did not participate.

August 12, 1980

APPENDIX A

U.S. DEPARTMENT OF TRANSPORTATION FORMS 7100.1, 7100.1-1, 7100.2, 7100.2-1

Form Approved: Budget Bureau No. 04-R3604

DEPARTMENT OF TRANSPORTATION

LEAK REPORT—DISTRIBUTION SYSTEM

REPORT DATE

INSTRUCTIONS: Complete this side of this form for each incident regardless of cause. Check appropriate box for specific cause of leak or failure and complete the pertinent part(s) on the reverse side.

☐ CORROSION PART A ☐ DAMAGE BY OUTSIDE FORCES—PART B ☐ CONSTRUCTION DEFECT OR MATERIAL FAILURE—PART C ☐ OTHER *(Describe incident on detail on writing and attach to this form where parts are not applicable.)*

If material to answer an applicable question is not available this should be stated. Only such portions of the form as apply to the particular leak are to be completed. In all parts of the form which are not applicable, the letters "NA" should be inserted so that every item is completed. If additional instruction is needed to complete this form, the operator may telephone the Department of Transportation, Office of Pipeline Safety, Area Code 202, 962-6000, Monday through Friday, 8:30 A.M. to 5:00 P.M. Eastern Time.

GENERAL

1 OPERATOR INFORMATION

NAME OF OPERATOR

NUMBER & STREET

CITY & COUNTY

STATE & ZIP CODE

REPORTING OFFICIAL'S TELEPHONE NUMBER *(Include Area Code)*

2. LOCATION AND TIME OF LEAK OR FAILURE

a. NUMBER & STREET

CITY & COUNTY

STATE & ZIP CODE

b. TIME OF DETECTION (1) DATE (2) HOUR

c. HOURS & MINUTES BETWEEN TIME OF DETECTION & TIME ESCAPE OF GAS WAS STOPPED

d. ESTIMATED PRESSURE AT POINT AND TIME OF INCIDENT *(PSIG)*

e. MAXIMUM ALLOWABLE OPERATING PRESSURE *(PSIG)*

3 METHOD OF LEAK OR FAILURE DETECTION

a. Method: (1) ☐ Routine Maintenance survey (2) ☐ Outside party

b. Reported by: (1) ☐ Operator personnel (2) ☐ Agency causing damage (3) ☐ Customer (4) ☐ Police (5) ☐ Public (6) ☐ Other *(Specify)*

4. PART OF SYSTEM WHERE LEAK OR FAILURE OCCURRED

a. ☐ Main c. ☐ Other *(Specify)*

b. ☐ Service

5 PART OF SYSTEM WHICH LEAKED OR FAILED

a. Part (1) ☐ Pipe (2) ☐ Valve (3) ☐ Fitting (4) ☐ Drip (5) ☐ Regulator (6) ☐ Tap connection (7) ☐ Other *(Specify)*

b. Date installed

6. MATERIAL WHICH LEAKED OR FAILED

a. Material (1) ☐ Steel (2) ☐ Plastic (3) ☐ Cast iron (4) ☐ Copper (5) ☐ Ductile iron (6) ☐ Wrought iron (7) ☐ Other *(Specify)*

b. Was the material that leaked or failed the same material as adjoining pipe or component? (1) ☐ Yes (2) ☐ No *(If "No," describe material in the adjoining component or parts)*

c. Is a metallurgical analysis planned? (1) ☐ Yes (2) ☐ No

7. ORIGIN OF LEAK OR FAILURE

a. ☐ Base material fracture
b. ☐ Longitudinal weld
c. ☐ Girth weld
d. ☐ Other field weld
e. ☐ Corrosion
f. ☐ Other *(Specify)*

8. PIPE DESCRIPTION *(Where applicable)*

a. Nominal Diameter *(Inches)*	b. Nominal wall thickness *(Inches)*
c. Specification and grade	d. Grade

9 TYPE OF REPAIR

a. Pipe (1) ☐ Weld over sleeve (2) ☐ Patch-welded (3) ☐ Clamp (4) ☐ Replace pipe *(Length)* _____ feet (5) ☐ Other repair or disposition *(Specify)*

b. Component (1) ☐ Replaced (2) ☐ Reconditioned (3) ☐ Other *(Specify)*

10. PERSONAL INJURY OR PROPERTY DAMAGE RESULTING FROM ESCAPE OF GAS

a. Number of employee(s)
(1) Fatalities
(2) Suffering lost-time injuries

b. Number of non-employee(s)
(1) Fatalities
(2) Injured and requiring medical treatment other than on-site first aid

	Yes	No
c. Rupture occurred	(1) ☐	(2) ☐
d. Gas ignited	(1) ☐	(2) ☐
e. Explosion occurred	(1) ☐	(2) ☐
f. Incident induced any secondary explosions or fires	(1) ☐	(2) ☐

g. Estimated value of operator's property damage $

11. ENVIRONMENTAL DESCRIPTION

a. Predominant type of area (1) ☐ Commercial (2) ☐ Industrial (3) ☐ Residential (4) ☐ Rural (5) ☐ Unknown (6) ☐ Other *(Specify)*

b. Predominant above-ground structure adjacent to leak

	Multi-story	Single-story
(1) Commercial	a ☐	b ☐
(2) Industrial	a ☐	b ☐
(3) Residential	a ☐	b ☐
(4) Other *(Specify)*	a ☐	b ☐

c. Approximate distance to nearest above ground structure *(Within 1 mile of leak)* _____ feet

d. Did other underground facility(ies) contribute to occurrence of leak in any manner? ☐ Yes ☐ No

e. If so, what was effect of existence of other facility(ies)?

f. Was other utility(ies) imperiled by the leak? (1) ☐ Yes (2) ☐ No

g. Distance of other facility(ies) or utility(ies) from leak or failure location

Other facility(ies) contributing to: _____Ft. (1) ☐ Other gas; _____Ft. (2) ☐ Telephone; _____Ft. (3) ☐ Electric; _____Ft. (4) ☐ Sewers *(Storm)*; _____Ft. (5) ☐ Sewers *(Other)*; _____Ft. (6) ☐ Water; _____Ft. (7) ☐ Other *(Specify)* _____

Other utility(ies) imperiled: (8) ☐ _____Ft.; (9) ☐ _____Ft.; (10) ☐ _____Ft.; (11) ☐ _____Ft.; (12) ☐ _____Ft.; (13) ☐ _____Ft.; (14) ☐ _____Ft. _____

h. Location of leak or failure (1) ☐ Within building (2) ☐ Above ground (3) ☐ Below ground (4) ☐ Below water (5) ☐ Below other paved area *(Specify)* _____ (6) ☐ Below walkway (7) ☐ Below road — a ☐ Paved b ☐ Median or unpaved

i. Depth of cover _____ inches

j. Soil information at pipe depth (1) ☐ Sand (2) ☐ Rock (3) Estimated soil temperature at point of leak _____° F

12. ADDITIONAL DESCRIPTION OF INCIDENT OR FOR CONTINUATION OF EXPLANATION OF ITEMS ABOVE

NAME AND TITLE OF REPORTING OFFICIAL

SIGNATURE OF REPORTING OFFICIAL

Form DOT F 7100.1 (1-70)

APPENDIX A

PART—A CORROSION

1 GENERAL CORROSION INFORMATION

a. Location
(1) ☐ Internal corrosion
(2) ☐ External corrosion

b. Description
(1) ☐ Pitting
(2) ☐ General

c. Cause
(1) ☐ Galvanic
(2) ☐ Bacterial
(3) ☐ Stray current
(4) ☐ Other (Specify) _____

2 PIPE COATING INFORMATION

a. Coating
(1) ☐ Bare
(2) ☐ Coated
(3) ☐ Wrapped

b. Year installed _____

c. Method of application
(1) ☐ Mill coated
(2) ☐ Yard coated
(3) ☐ Field coated
(4) ☐ Unknown

d. Material
(1) ☐ Coal tar
(2) ☐ Asphalt
(3) ☐ Wax
(4) ☐ Prefabricated film
(5) ☐ Thin-film coatings
(6) ☐ Other (Specify) _____

3 CAUSE OF COATING FAILURE
a. ☐ Damage
b. ☐ Defective material
c. ☐ Defective application
d. ☐ Decomposition
e. ☐ Other (Specify) _____

4 CATHODIC PROTECTION
a. ☐ Yes
b. ☐ No
c. Year started _____
d. Type
(1) ☐ Impressed
(2) ☐ Galvanic
(3) ☐ Other (Specify) _____

5 pH OF SOIL NEAR LEAK

6 SOIL RESISTIVITY
a. Last soil resistivity measurement in the area of the leak _____ (ohm-cm)
b. Date of measurement
c. Distance from leak (feet)

7 PIPE TO SOIL POTENTIAL
a. Last pipe to soil potential measurement at nearest points on each side of the leak _____ (volts) and _____ (volts)
b. Distances from leak to each measurement point _____ (feet) and _____ (feet)
c. Date of measurement

PART—B DAMAGE BY OUTSIDE FORCES

1 PRIMARY CAUSE OF LEAK
a. ☐ Damage by equipment operated by or for operator
b. ☐ Damage by equipment operated by outside party
c. ☐ Damage by earth movement
d. ☐ Other (Specify) _____

2 LOCATING INFORMATION FOR EXCAVATING AND BLASTING INCIDENTS
a. When leak resulted from damage by outside party's equipment, did the operator get prior notification that the equipment would be used in the area?
(1) ☐ Yes (3) Date (4) Time
(2) ☐ No

b. Was the pipeline marked or identified? (1) ☐ Yes (2) ☐ No
(3) If "Yes," what type of marking or identification was used to advise outside party of location of pipeline
a. ☐ Permanent markers
b. ☐ Map furnished
c. ☐ Temporary stakes
d. ☐ Paint
e. ☐ Excavation
f. ☐ On site observation
g. ☐ Other (Specify) _____

c. Does statute or ordinance require the outside party to determine the location of pipelines
(1) ☐ Yes (2) ☐ No

3 DAMAGE BY EARTH MOVEMENT
a. ☐ Subsidence
b. ☐ Earthquake
c. ☐ Land slide
d. ☐ Washout
e. ☐ Other (Specify) _____

4 Was the earth movement caused by direct or indirect action by others? (1) ☐ Yes (2) ☐ No (If "Yes," explain below)

PART—C CONSTRUCTION DEFECT OR MATERIAL FAILURE

1 PRIMARY CAUSE OF LEAK
a. ☐ Construction defect
b. ☐ Material failure

2 PIPE CLASS (If applicable)

a. Steel
(1) ☐ Seamless
(2) ☐ Electric-resistance welded
(3) ☐ Submerged-arc welded
(4) ☐ Butt welded
(5) ☐ Furnace-lap welded

b. Plastic
(1) ☐ Thermoplastic (2) ☐ Thermosetting
Reinforced ((1) or (2))
a. ☐ Yes
b. ☐ No

c. Cast Iron
(1) ☐ Centrifugally-cast
(2) ☐ Pit cast

d. ☐ Other pipe material (Specify) _____

3 INITIAL TEST DATA
Was this facility strength proofed or leak tested at the time of installation?
a. ☐ Yes b. ☐ No c. ☐ Not known
If "Yes" was test medium:
(1) ☐ Air
(2) ☐ Gas
(3) ☐ Water
(4) ☐ Other (Specify) _____

(5) Date of test	(6) Minimum test pressure (psig)	(7) Time held at test pressure (Hours)	(8) Estimated test pressure at point of leak (psig)

4 SUBSEQUENT TEST DATA
Have there been later strength proof or leak test made? a. ☐ Yes b. ☐ No c. ☐ Not known
If "Yes," Was test medium:
(1) ☐ Air
(2) ☐ Gas
(3) ☐ Water
(4) ☐ Other (Specify) _____

(5) Date of test	(6) Minimum test pressure (psig)	(7) Time held at test pressure (Hours)	(8) Estimated test pressure at point of leak (psig)

U.S. GOVERNMENT PRINTING OFFICE : 1979 O—870-870
GPO 0 894-218

APPENDIX A

NOTICE: This report is required by 49 CFR, Part 191. Failure to report can result in a civil penalty not to exceed $1,000 for each violation for each day that each violation persists, except that the maximum civil penalty shall not exceed $200,000 as provided in 49 U.S.C. 1679.

Form Approved OMB No. 04-R1608

DEPARTMENT OF TRANSPORTATION

ANNUAL REPORT FOR CALENDAR YEAR 19___
DISTRIBUTION SYSTEM

When data are readily available, such data should be reported. Current year reporting should be actual data. When back data are not obtainable without a major effort to reconstruct prior years, estimates may be reported and so noted. A brief explanation of the procedures used in deriving estimates should be attached. Each operator shall submit separate reports for each of his corporate subsidiaries that transports gas. If additional instruction is needed to complete this form, the operator may telephone the Department of Transportation, Office of Pipeline Safety, Area Code 202 962-6000, Monday through Friday, 8:30 a.m. to 5:00 p.m. Eastern Time.

PART A—OPERATOR INFORMATION

NAME OF OPERATOR	NUMBER & STREET	REPORTING OFFICIAL'S TELEPHONE NUMBER (Include Area Code)
CITY & COUNTY	STATE & ZIP CODE	

19	YEAR	OPID	← OPS USE ONLY

	ITEM		UNKNOWN	PRIOR TO 1930	1930 THRU 1939	1940 THRU 1949	1950 THRU 1959	1960 THRU 1969	1/1/70 TO 12/31 OF REPORT ING YEAR	SYSTEM TOTAL
PART B — DISTRIBUTION SYSTEM PIPE ON SYSTEM AT END OF YEAR	Cast or Wrought Iron	MILES OF MAINS								
		NUMBER OF SERVICES								
	Coated* Steel or Cathodic Protected Steel	MILES OF MAINS								
		NUMBER OF SERVICES								
PART C — CATHODICALLY PROTECTED SYSTEM	Coated* Steel or Cathodic Protected	MILES OF MAINS								
		NUMBER OF SERVICES								
	Bare or Ineffectively Protected Steel	MILES OF MAINS								
		NUMBER OF SERVICES								
PART D — LEAKS ON MAINS REPAIRED DURING YEAR (Do not include reported under Section 191.9)	PIPE	a								
		b								
	VALVE	a								
		b								
	FITTING	a								
		b								
	DRIP	a								
		b								
	REGULATOR	a								
		b								
	TAP CONNECTION	a								
		b								
	OTHER	a								
		b								
PART E — TOTAL LEAKS REPAIRED DURING YEAR BY CAUSE (Number by pipe material)	PIPE	a								
		b								
	VALVE	a								
		b								
	FITTING	a								
		b								
	DRIP	a								
		b								
	REGULATOR	a								
		b								
	TAP CONNECTION	a								
		b								
	OTHER	a								
		b								
	CORROSION									
	DAMAGE BY OUTSIDE FORCE									
	CONSTRUCTION DEFECT									
	MATERIAL FAILURE									
	OTHER									

* Pipe coated with any hot or cold applied coating or wrapper

b Pipe without any type of hot or cold applied coating or wrapper

Form DOT F 7100.1-1 (REVISED 1/70)

APPENDIX A

PART G — MILES OF MAINS IN SYSTEM AT END OF YEAR

MAINS	NOMINAL SIZE: 1" OR LESS	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 6"	8"	10"	12"	OVER 12"	TOTAL
BY MATERIAL — STEEL									
WROUGHT IRON									
CAST IRON									
DUCTILE IRON									
COPPER									
PLASTIC									
OTHER (Specify) _____									
TOTAL SYSTEM									

PART H — NUMBER OF SERVICES IN SYSTEM AT END OF YEAR

SERVICES	UNKNOWN	½" OR LESS	OVER ½" THRU 1"	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 6"	OVER 6"	TOTAL
BY MATERIAL — STEEL								
CAST IRON								
COPPER								
PLASTIC								
OTHER (Specify) _____								
TOTAL SYSTEM								

PART I

MAINS AND SERVICES INSTALLED DURING YEAR	EXPANSION	REPLACEMENT
MILES OF MAINS		
NUMBER OF SERVICES		

PART J

MAINS AND SERVICES RETIRED DURING YEAR	
MILES OF MAINS	
NUMBER OF SERVICES	

PART K — MILES OF MAINS CATHODICALLY PROTECTED

PART L — CATHODICALLY PROTECTED STEEL: FREQUENCY OF INSPECTION

LOCATION [C]	FREQUENCY [D] OF INSPECTION BY TYPE: P/S POTENTIAL	CURRENT OUTPUT	INDICATING METER (Rectifier, critical)
COMMERCIAL			
INDUSTRIAL			
RESIDENTIAL			
RURAL			

PART M — LEAK SURVEYS DURING YEAR: % OF SYSTEM COVERED BY TYPE AND FREQUENCY OF SURVEY

LOCATION [C]	% OF SYSTEM COVERED: FLAME IONIZATION	VEGETATION	AVAILABLE DETECTING (Combustible gas indicator)	GAS HOUND (Combustible gas indicator)	MASSED	OTHER (Specify) _____	TOTAL [D]
COMMERCIAL							
INDUSTRIAL							
RESIDENTIAL							
RURAL							

PART N — UNACCOUNTED FOR GAS FOR LAST 5 YEARS BASED ON % OF TOTAL INPUT FOR 12 MONTHS ENDING JUNE 30 EXCLUDING CURRENT YEAR (The system for which these figures apply may include transmission)

YEARS	%
5	
4	
3	
2	
1	

PART O — UNACCOUNTED FOR GAS DURING PAST 12 MONTHS ENDING LAST JUNE 30 — %

PART P — NUMBER OF KNOWN SYSTEM LEAKS AT END OF YEAR SCHEDULED FOR REPAIR: MAINS; SERVICES

PART Q

TOTAL PERSONAL INJURIES ARISING ON PROPERTY DAMAGES REPORTED FROM RECORD OF GAS DURING YEAR	NUMBER OF EMPLOYEE(S) OF OPERATOR		NUMBER OF FIRES	
			NUMBER OF EXPLOSIONS	
	NUMBER OF EMPLOYEE(S) OF CONTRACTORS		NUMBER OF INDUCED SECONDARY EXPLOSIONS OR FIRES	
			ESTIMATED AGGREGATE VALUE OF PROPERTY DAMAGE TO: OPERATOR	$
	NUMBER OF NON-EMPLOYEE(S)		OTHERS — FOR ALL CASES REPORTED DURING THIS REPORTING YEAR	$

C Definitions of locations should be in accord with operator's public relations practice
D Frequency codes: 1-Weekly, 2-Bi-monthly, 3-Monthly, 4-Quarterly, 5-Semi-annually, 6-Annually, 7-Other, 8-No inspection or survey

NAME AND TITLE OF REPORTING OFFICIAL

SIGNATURE OF REPORTING OFFICIAL

APPENDIX A

Form Approved: Budget Bureau No. 04-R3605

DEPARTMENT OF TRANSPORTATION

LEAK OR TEST FAILURE REPORT—TRANSMISSION & GATHERING SYSTEMS

REPORT DATE

☐ LEAK REPORT ☐ TEST FAILURE REPORT ☐ NEW CONSTRUCTION ☐ EXISTING FACILITY *(Specify reason for test)*

INSTRUCTIONS: Complete this side of this form for each incident regardless of cause.
Check appropriate box for specific cause of leak or failure and complete the pertinent part(s) on the reverse side

☐ CORROSION PART—A ☐ DAMAGE BY OUTSIDE FORCES—PART—B ☐ CONSTRUCTION DEFECT OR MATERIAL FAILURE—PART—C ☐ OTHER *(Describe incident in detail in writing and attach to this form where parts are not applicable.)*

If material to answer an applicable question is not available this should be stated. Only such portions of the form as apply to the particular leak are to be completed. In all parts of the form which are not applicable, the letters "NA" should be inserted so that every item is completed. If additional instruction is needed to complete this form, the operator may telephone the Department of Transportation, Office of Pipeline Safety, Area Code 202, 96-26000, Monday through Friday, 8:30 AM to 5:00 PM Eastern Time.

GENERAL

1 OPERATOR INFORMATION
NAME OF OPERATOR
NUMBER & STREET
CITY & COUNTY
STATE & ZIP CODE
REPORTING OFFICIAL'S TELEPHONE NUMBER *(Include Area Code)*

2 LEAK WITH RUPTURE
a. Shear fracture *(feet)* b. Cleavage fracture *(feet)*
c. Has a fracture toughness test been made on the material that failed? (1) ☐ Yes (2) ☐ No
d. Is a metallurgical analysis planned? (1) ☐ Yes (2) ☐ No

3 LOCATION AND TIME OF LEAK OR FAILURE
a. Number & Street
City & County
State & ZIP Code b. Mile Post c. Survey Station No.
d. Time of Detection (1) Date (2) Hour e. HOURS & MINUTES BETWEEN TIME OF DETECTION AND TIME ESCAPE OF GAS WAS STOPPED
f. Estimated pressure at point and time of incident *(PSIG)* g. Maximum allowable operating pressure *(PSIG)*

4 LEAK OR FAILURE OCCURRED ON
a. ☐ Transmission system c. ☐ Gathering system
b. ☐ Transmission line of distribution system

5 PART OF SYSTEM WHICH LEAKED OR FAILED
a. Part
(1) ☐ Pipeline (4) ☐ Regulator station
(2) ☐ Compressor station (5) ☐ Meter station
(3) ☐ Dehydration plant (6) ☐ Other *(Specify)*
b. Date installed

6 ORIGIN OF LEAK OR FAILURE
a. ☐ Body of pipe g. ☐ Scraper trap
b. ☐ Girth weld h. ☐ Tap connection
c. ☐ Longitudinal weld i. ☐ Fitting *(Type)*
d. ☐ Other field weld j. ☐ Gas cooler
e. ☐ Component k. ☐ Other *(Specify)*
f. ☐ Valve

7. MATERIAL WHICH LEAKED OR FAILED
a. ☐ Steel b. ☐ Plastic c. ☐ Other *(Specify)*

8 PIPE DESCRIPTION
a. Nominal diameter *(Inches)* b. Nominal wall thickness *(Inches)*
c. Pipe specification d. Grade

9 TYPE OF REPAIR
a. Pipe
(1) ☐ Weld over-sleeve (4) ☐ Replace pipe *(length)* ____ feet
(2) ☐ Patch-welded
(3) ☐ Clamp (5) ☐ Other repair or disposition *(Specify)*
b. Component
(1) ☐ Replaced (3) ☐ Other *(Specify)*
(2) ☐ Reconditioned

10 PERSONAL INJURY OR PROPERTY DAMAGE RESULTING FROM ESCAPE OF GAS
a. Number of employee(s)
(1) Fatalities
(2) Suffering lost time injuries
b. Number of non-employee(s)
(1) Fatalities
(2) Injured and requiring medical treatment other than on-site first aid

	Yes	No
c. Rupture occurred	(1) ☐	(2) ☐
d. Gas ignited	(1) ☐	(2) ☐
e. Explosion occurred	(1) ☐	(2) ☐
f. Incident induced any secondary explosions or fires	(1) ☐	(2) ☐

g. Estimated value of operator's property damage $

11. ENVIRONMENTAL DESCRIPTION
a. Predominant type of area

(1) At time of construction	(2) At time of incident
a ☐ Commercial	a ☐ Commercial
b ☐ Industrial	b ☐ Industrial
c ☐ Residential	c ☐ Residential
d ☐ Rural	d ☐ Rural
e ☐ Undeveloped	e ☐ Undeveloped
f ☐ Unknown	f ☐ Other *(Specify)*
g ☐ Other *(Specify)*	

b. Predominant above ground structure adjacent to leak

	Multi-story	Single-story
(1) Commercial	a ☐	b ☐
(2) Industrial	a ☐	b ☐
(3) Residential	a ☐	b ☐
(4) None ☐		
(5) Other *(Specify)*	a ☐	b ☐

c. Approximate distance to nearest above-ground structure *(Within 1 mile of leak)* ____ feet
d. Did other underground facility(ies) contribute to occurrence of leak in any manner? (1) ☐ Yes (2) ☐ No
e. If so, what was effect on existence of other facility(ies)?
f. Was other utility(ies) imperiled by the leak? (1) ☐ Yes (2) ☐ No
g. Distance of other facility(ies) or utility(ies) from leak or failure location

Other facility(ies) contributing to			Other utility(ies) imperiled
____ Ft. (1) ☐	Other gas	(8) ☐	____ Ft.
____ Ft. (2) ☐	Telephone	(9) ☐	____ Ft.
____ Ft. (3) ☐	Electric	(10) ☐	____ Ft.
____ Ft. (4) ☐	Sewers *(Storm)*	(11) ☐	____ Ft.
____ Ft. (5) ☐	Sewers *(Other)*	(12) ☐	____ Ft.
____ Ft. (6) ☐	Water	(13) ☐	____ Ft.
____ Ft. (7) ☐	Other *(Specify)*	(14) ☐	____ Ft.

h. Location of leak or failure
(1) ☐ Within building (5) ☐ Below walkway
(2) ☐ Above ground (6) ☐ Below roadway a ☐ Paved
(3) ☐ Below ground b ☐ Median or unpaved
(4) ☐ Below water (7) ☐ Below other paved area *(Specify)*
(i) Depth of cover ____ inches
(j) Soil information at pipe depth (1) ☐ Soil (2) ☐ Rock
(3) Estimated soil temperature at point of leak ____ °F

12. ADDITIONAL DESCRIPTION OF INCIDENT OR FOR CONTINUATION OF EXPLANATION OF ITEMS ABOVE

NAME AND TITLE OF REPORTING OFFICIAL SIGNATURE OF REPORTING OFFICIAL

Form DOT F 7100.2 (1-70)

U.S. GOVERNMENT PRINTING OFFICE: 1972 O - 460-735

APPENDIX A

PART—A CORROSION

1 GENERAL CORROSION INFORMATION

a Location
(1) ☐ Internal corrosion
(2) ☐ External corrosion

b Description
(1) ☐ Pitting
(2) ☐ General

c. Cause
(1) ☐ Galvanic
(2) ☐ Bacterial
(3) ☐ Stray current
(4) ☐ Other (*Specify*) _____

2. PIPE COATING INFORMATION

a. Coating
(1) ☐ Bare
(2) ☐ Coated
(3) ☐ Wrapped

b Year installed ____

c. Method of application
(1) ☐ Mill coated
(2) ☐ Yard coated
(3) ☐ Field coated
(4) ☐ Unknown

d. Material
(1) ☐ Coal tar
(2) ☐ Asphalt
(3) ☐ Wax
(4) ☐ Prefabricated film
(5) ☐ Thin-film coatings
(6) ☐ Other (*Specify*) _____

3 CAUSE OF COATING FAILURE

a ☐ Damage
b ☐ Defective material
c ☐ Defective application
d ☐ Decomposition
e. ☐ Other (*Specify*) _____

4 CATHODIC PROTECTION

a. ☐ Yes
b ☐ No
c Year started ____

d Type
(1) ☐ Impressed
(2) ☐ Galvanic
(3) Other (*Specify*) _____

5 pH OF SOIL NEAR LEAK

6 SOIL RESISTIVITY

a. Last soil resistivity measurement on the area of the leak _____ (ohm-cm)

b Date of measurement

c. Distance from leak (*Feet*)

7 PIPE-TO-SOIL POTENTIAL

a Last pipe-to-soil potential measurement at nearest points on each side of the leak _____ (*Volts*) and _____ (*Volts*)

b. Distances from leak to each measurement point _____ (*Feet*) and _____ (*Feet*)

c. Date of measurement

PART—B DAMAGE BY OUTSIDE FORCES

1 PRIMARY CAUSE OF LEAK

a. ☐ Damage by equipment operated by or for operator
b. ☐ Damage by equipment operated by outside party
c. ☐ Damage by earth movement
d ☐ Other (*Specify*) _____

2 LOCATING INFORMATION FOR EXCAVATING AND BLASTING INCIDENTS

a. When leak resulted from damage by outside party's equipment, did the operator get prior notification that the equipment would be used in the area?
(1) ☐ Yes (2) ☐ No
(3) Date
(4) Time

b. Was the pipeline marked or identified? (1) ☐ Yes (2) ☐ No
(1) If "Yes," what type of marking or identification was used to advise outside party of location of pipeline?
a ☐ Permanent markers
b ☐ Map furnished
c ☐ Temporary stakes
d ☐ Paint
e ☐ Excavation
f ☐ On-site observation
g ☐ Other (*Specify*) _____

c. Does statute or ordinance require the outside party to determine the location of pipelines
(1) ☐ Yes (2) ☐ No

3 DAMAGE BY EARTH MOVEMENT
a. ☐ Subsidence
b ☐ Earthquake
c. ☐ Landslide
d ☐ Washout
e ☐ Other (*Specify*) _____

f. Was the earth movement caused by direct or indirect action of others? (1) ☐ Yes (2) ☐ No (*If Yes, explain*)

PART—C CONSTRUCTION DEFECT OR MATERIAL FAILURE

1 PRIMARY CAUSE OF LEAK a ☐ Construction defect b ☐ Material failure

2 DESCRIPTION OF PIPE

a Manufacturer

b. Where was pipe manufactured

c. Year manufactured _____
(1) ☐ Expanded (2) ☐ Nonexpanded

d Method of transportation
(1) ☐ Truck (2) ☐ Rail (3) ☐ Ship (4) ☐ Other (*Specify*) _____ (5) ☐ Unknown

3 PIPE CLASS

a Steel
(1) ☐ Seamless
(2) ☐ Electric-resistance welded
(3) ☐ Submerged arc welded
(4) ☐ Burn welded
(5) ☐ Furnace-lap welded

b. Plastic
(1) ☐ Thermoplastic
(2) ☐ Thermosetting
Reinforced (*(1) or (2)*)
a ☐ Yes b. ☐ No

c. Cast Iron
(1) ☐ Centrifugally cast
(2) ☐ Pit cast

d Other pipe material (*Specify*) _____

4 CONSTRUCTION TYPE AT TIME OF LEAK OR FAILURE
AS DEFINED IN USAS B31.8-1968 CODE ☐ A ☐ B ☐ C ☐ D

5 INITIAL TEST DATA
Was the base strength proof tested at the time of installation?
a. ☐ Yes b. ☐ No c. ☐ Not known
If "Yes," what was test medium
(1) ☐ Air
(2) ☐ Gas
(3) ☐ Water
(4) ☐ Other (*Specify*) _____
(5) Date of test
(6) Minimum test pressure (*psig*)
(7) Time held at test pressure (*Hours*)
(8) Estimated test pressure at point of leak (*psig*)

6 SUBSEQUENT TEST DATA
Have there been base strength proof tests made? a ☐ Yes b. ☐ No c. ☐ Not known
If "Yes," What was test medium:
(1) ☐ Air
(2) ☐ Gas
(3) ☐ Water
(4) ☐ Other (*Specify*) _____
(5) Date of test
(6) Minimum test pressure (*psig*)
(7) Time held at test pressure (*Hours*)
(8) Estimated test pressure at point of leak (*psig*)

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APPENDIX A

NOTICE: This report is required by 49 CFR, Part 191. Failure to report can result in a civil penalty not to exceed $1,000 for each violation for each day that such violation persists, except that the maximum civil penalty shall not exceed $lm,000 as provided in 49 U.S.C. 1679

Form Approved O.M.B. No. 04-R5006

DEPARTMENT OF TRANSPORTATION

ANNUAL REPORT FOR CALENDAR YEAR 19___
GAS TRANSMISSION & GATHERING SYSTEMS

When data are readily available, such data should be reported. Current year reporting should be actual data. When back data are not obtainable without a major effort to reconstruct prior years, estimates may be reported and so noted. A brief explanation of the procedures used in deriving estimates should be attached. Each operator shall submit separate reports for each of his corporate subsidiaries that transports gas. If additional instruction is needed to complete this form, the operator may telephone the Department of Transportation, Research and Special Programs Administration, Materials Transportation Bureau, Area Code 202-472-1024, Mondays through Fridays, 8:30 a.m. to 4:00 p.m. Eastern Time

PART A—OPERATOR INFORMATION

NAME OF OPERATOR	NUMBER & STREET	REPORTING OFFICIAL'S TELEPHONE NUMBER (Include Area Code)
CITY AND COUNTY	STATE & ZIP CODE	

*	TP	YEAR	OPS I.D.	← OPS USE ONLY

	ITEM		UNKNOWN	PRIOR TO 1930	1930 THRU 1939	1940 THRU 1949	1950 THRU 1959	1960 THRU 1969	1/1/70 TO 12/31 OF REPORTING YEAR	SYSTEM TOTAL
PART B — DESCRIPTION OF PIPE IN SYSTEM AT END OF YEAR	Miles of Pipe by Construction Date	TRANSMISSION								
		GATHERING								
	Miles of Coated[a] Pipe by Coating Date	TRANSMISSION								
		GATHERING								
PART C — CATHODICALLY PROTECTED SYSTEM	Miles of Coated[a] Pipe by Protection Date	TRANSMISSION								
		GATHERING								
	Miles of Bare[b] Pipe by Protection Date	TRANSMISSION								
		GATHERING								

PART D — TRANSMISSION SYSTEM LEAKS REPAIRED DURING YEAR (By Year Installed) (If "0" is Leaks repaired and "NR" is Leaks not repaired under Sec. 192.703)

BODY OF PIPE	a										
	NR										
GIRTH WELD	a										
	NR										
LONGITUDINAL WELD	a										
	NR										
OTHER WELDS	a										
	NR										
COMPRESSOR[c]	a										
	NR										
VALVE	a										
	NR										
SCRAPER TRAP	a										
	NR										
TAP CONNECTION	a										
	NR										
FITTING	a										
	NR										
GAS COOLER	a										
	NR										
OTHER	a										
	NR										

PART E — GATHERING SYSTEM LEAKS REPAIRED DURING YEAR (By Year Installed) (If "0" is Leaks repaired and "NR" is Leaks not repaired under Sec. 192.703)

BODY OF PIPE	a										
	NR										
GIRTH WELD	a										
	NR										
LONGITUDINAL WELD	a										
	NR										
OTHER WELDS	a										
	NR										
COMPRESSOR[c]	a										
	NR										
VALVE	a										
	NR										
SCRAPER TRAP	a										
	NR										
TAP CONNECTION	a										
	NR										
FITTING	a										
	NR										
GAS COOLER	a										
	NR										
OTHER	a										
	NR										

[a] Pipe coated with any hot or cold applied coating or wrapper
[b] Pipe without any type of hot or cold applied coating or wrapper
[c] Compressor includes the main body of the unit and superchargers. Units that are not listed separately on the left appear

Form DOT F 7100.2-1 (REVISED 12-79)

APPENDIX A

PART F — TOTAL LEAKS REPAIRED DURING YEAR BY CAUSE (NUMBER BY YEAR INSTALLED)

CAUSE OF LEAK	UNKNOWN	PRIOR TO 1960	1960 THRU 1964	1965 THRU 1967	1968 THRU 1969	1/1/70 TO 12/31 OF REPORTING YEAR	SYSTEM TOTAL
CORROSION							
DAMAGE BY OUTSIDE FORCE							
CONSTRUCTION DEFECT							
MATERIAL FAILURE							
OTHER							

PART G — MILES OF PIPE IN SYSTEM AT END OF YEAR

BY MATERIAL

SYSTEM	STEEL	PLASTIC	OTHER (Specify)	
TRANSMISSION →				
GATHERING →				

BY NOMINAL SIZE (MILES)

SYSTEM	1" OR LESS	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 6"	8"	10"	12"	14"
TRANSMISSION								
GATHERING								
SYSTEM TOTAL								

SYSTEM	16"	18"	20"	22"	24"	26"	28"	30"
TRANSMISSION								
GATHERING								
SYSTEM TOTAL								

SYSTEM	32"	34"	36"	38"	40"	42"	ABOVE 42"
TRANSMISSION							
GATHERING							
SYSTEM TOTAL							

PART H — MILES INSTALLED DURING YEAR

SYSTEM	EXPANSION	REPLACEMENT
TRANSMISSION		
GATHERING		

PART I — MILES RETIRED DURING YEAR

SYSTEM	
TRANSMISSION	
GATHERING	

PART J — MILES OF TOTAL SYSTEM CATHODICALLY PROTECTED

PART K — CATHODICALLY PROTECTED SYSTEM FREQUENCY OF INSPECTION

LOCATION [D]	FREQUENCY [E] OF INSPECTION BY TYPE: P/S POTENTIAL	CURRENT OUTPUT	INDICATING METER (Warning system)
COMMERCIAL			
INDUSTRIAL			
RESIDENTIAL			
RURAL			

PART L — FREQUENCY AND METHOD OF LEAK SURVEYS DURING YEAR

LOCATION [D]	FREQUENCY [E] OF SURVEY BY METHOD: AERIAL	FLAME IONIZATION	COMBUSTIBLE GAS INDICATOR	INFRARED	VEGETATION	OTHER
COMMERCIAL						
INDUSTRIAL						
RESIDENTIAL						
RURAL						

PART M

NUMBER OF KNOWN SYSTEM LEAKS AT END OF YEAR SCHEDULED FOR REPAIR →	
TRANSMISSION	
GATHERING	

PART N — TOTAL PERSONAL INJURIES OR PROPERTY DAMAGE RESULTING FROM ESCAPE OF GAS DURING YEAR

NUMBER OF EMPLOYEE(S) OF OPERATOR	FATALITIES	
	SUFFERING LOST TIME INJURIES	
NUMBER OF EMPLOYEE(S) OF CONTRACTORS	FATALITIES	
	SUFFERING LOST TIME INJURIES	
NUMBER OF NON-EMPLOYEE(S)	FATALITIES	
	INJURED & REQUIRING MEDICAL TREATMENT OTHER THAN ON-SITE FIRST AID	

NUMBER OF FIRES	
NUMBER OF EXPLOSIONS	
NUMBER OF INDUCED SECONDARY EXPLOSIONS OR FIRES	

ESTIMATED AGGREGATE VALUE OF PROPERTY DAMAGE TO:		
	OPERATOR	$
	OTHERS — FOR ALL CASES SETTLED DURING THE REPORTING YEAR	$

REMARKS

D Definitions of locations should be in accord with operator's customary practice.
E Frequency Codes: 1-Weekly, 2-Bi-monthly, 3-Monthly, 4-Quarterly, 5-Semiannually, 6-Annually, 7-Other, 0-No inspection or survey

NAME AND TITLE OF REPORTING OFFICIAL	SIGNATURE OF REPORTING OFFICIAL